

CLAIMS

1. A plant for generating active and reactive electric power for a high-voltage distribution or transmission network (110), comprising at least one electric generator (200) which is coupled to at least one gas and/or steam turbine (102) via a shaft means (101) and comprises at least one winding, characterized in that the winding of at least one of the electric generators comprises a solid insulation system comprising at least two semiconducting layers, each layer constituting essentially an equipotential surface, and also intermediate solid insulation, wherein at least one of the layers has substantially the same coefficient of thermal expansion as the solid insulation.

2. A plant as claimed in claim 1, ~~characterized in that~~ ^{wherein} the generator comprises a magnetic circuit with a magnetic core.

3. ~~A plant as claimed in claim 2, characterized in that~~ the flux paths in the core of the magnetic circuit consist of laminated sheet and/or cast iron and/or powder-based iron and/or forged iron.

4. A plant as claimed in any of claims 1-3, characterized in that the solid insulation is built up of a cable (6) intended for high voltage, comprising one or more current-carrying conductors (31) surrounded by at least two semiconducting layers (32, 34) and intermediate insulating layers (33) of solid insulation.

5. A plant as claimed in claim 4, characterized in that the innermost semiconducting layer (32) is at substantially the same potential as the conductor(s) (31).

6. A plant as claimed in either claim 4 or claim 5, characterized in that one of the outer semiconducting layers (34) is arranged to form essentially an equipotential surface surrounding the conductor(s) (31).

7. A plant as claimed in claim 6, ~~characterized in that~~ ^{wherein} said outer semiconducting layer ~~is~~ is connected to a selected potential.

8. A plant as claimed in claim 7, ~~characterized in that~~ ^{wherein} the selected potential is earth potential.

9. ~~A plant as claimed in any of claims 4-8, characterized in that at least two of said layers have substantially the same coefficient of thermal expansion.~~

10. A plant as claimed in any of claims 4-6, characterized in that the current-carrying conductor comprises a plurality of strands, only a few of the strands not being insulated from each other.

11. A plant as claimed in any of claims 1-10, characterized in that the winding consists of a cable comprising one or more current-carrying conductors (2), each conductor consisting of a number of strands, an inner semiconducting layer (3) being arranged around each conductor, an insulating layer (4) of solid insulation being arranged around each inner semiconducting layer (3) and an outer semiconducting layer (5) being arranged around each insulating layer (4).

12. ~~A plant as claimed in claim 11, characterized in that the cable also comprises a metal screen and a sheath.~~

13. ~~A plant as claimed in any of the preceding claims, characterized in that at least one electric generator (200) is arranged to supply the out-going electric network (110) directly without any intermediate connection of a step-up transformer (unit transformer).~~

14. A plant as claimed in any of the preceding claims, characterized in that at least one generator (200) is arranged to supply an out-going network consisting of at least two part-networks, at least one part-network being supplied via an intermediate system transformer.

15. A plant as claimed in any of the preceding claims, characterized in that it comprises several generators, each of which lacks an individual step-up transformer but which, via a system transformer common to the generators, is connected to the transmission or distribution network (110).

16. A plant as claimed in any of the preceding claims, characterized in that the windings (9, 51-53) of the stator (1) in at least one generator (200) are arranged for connection to more than one voltage level.

17. A plant as claimed in claim 15, characterized in that one of said voltage levels relates to generation of auxiliary power, this being generated from a separate winding (9) in the generator (200).

18. A plant as claimed in any of the preceding claims, characterized in that at least one generator (200) is earthed via an impedance.

19. A plant as claimed in any of claims 1-17, characterized in that at least one generator (200) is directly earthed.

20. A plant as claimed in any of the preceding claims, characterized in that the stator (1) of the generator (200) is cooled at earth potential by means of a flow of gas and/or liquid.

21. A plant as claimed in any of the preceding claims, characterized in that the cables (6) intended for high voltage have a conductor area of between 50 and 3000 mm² and have an outer diameter of between 20 and 250 mm.

22. A plant as claimed in any of the preceding claims, characterized in that at least one winding (9, 51-52) of the stator (1) is carried out with integral slot winding.

23. A plant as claimed in any of the preceding claims, characterized in that at least one winding (9, 51-52) of the stator (1) is carried out with fractional slot winding.

24. A plant as claimed in any of the preceding claims, characterized in that the rotor (2) of at least one generator is arranged for two or four poles.

25. A plant as claimed in any of the preceding claims, characterized in that the voltage level is controllable $\pm 20\%$ of the rated voltage.

26. A plant as claimed in any of the preceding claims, characterized in that the winding of the generator is arranged for self-regulating field control and lacks auxiliary means for control of the field.

27. A plant as claimed in any of the preceding claims, characterized in that the stator of at least one generator is composed of axially combined, plate-shaped sections, preferably as whole sections in peripheral direction.

28. A plant for generating active and reactive electric power for a high-voltage distribution or transmission network (110), comprising at least one electric generator (200) which is coupled to at least one gas and/or steam turbine (101) via a shaft means (101) and comprises at least one winding, characterized in that the winding of at least one of the electric generators

comprises an insulation system which, as regards its thermal and electrical properties, permits a voltage level in excess of 36 kv.

29. An electric generator (200) arranged to be coupled to at least one gas and/or steam turbine (102) via a shaft means (101) and comprising at least one winding, characterized in that the winding comprises a solid insulation system consisting of at least two semiconducting layers, each layer constituting essentially an equipotential surface, and also intermediate solid insulation, wherein at least one of the layers has substantially the same coefficient of thermal expansion as the solid insulation.

30. ~~An electric generator as claimed in claim 29 that includes the features defining the generator claimed in any of claims 2-28.~~

31. ~~A procedure for manufacturing an electric generator as claimed in claim 29 or claim 30, characterized in that the stator is wound at the plant site where the generator is to be used.~~

32. ~~A procedure as claimed in claim 31, characterized in that~~ the stator is manufactured at the factory axially divided into a plurality of plate-shaped, separate sections, each section preferably being manufactured as a whole section in peripheral direction.

Did
AE

A 12
A

all
A